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(54) **A METHOD AND SYSTEM FOR REALIZING THE ACCESS MANAGEMENT OF THE NETWORK DEVICES**

VERFAHREN UND SYSTEM ZUM REALISIEREN DER ZUGANGSVERWALTUNG DER  
NETZEINRICHTUNGEN

PROCÉDÉ ET SYSTÈME DE RÉALISATION DE LA GESTION D ACCÈS À DES DISPOSITIFS  
RÉSEAU

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• **MARLYN ET AL: "Service selection in the access network" ICC 2001. 2001 IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS. CONFERENCE RECORD. HELSINKY, FINLAND, JUNE 11 - 14, 2001; [IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS], NEW YORK, NY : IEEE, US, vol. 5, 11 June 2001 (2001-06-11), pages 1622-1626, XP010553789 ISBN: 978-0-7803-7097-5**

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## Description

### Field of the Invention

**[0001]** The present invention relates to device access technology in a communication network, and in particular to a method and system for implementing network device access management.

### Background of the Invention

**[0002]** In an existing communication network, applications of Access Server (AS) have become wide increasingly. The AS is typically located at a convergence layer of the communication network and is primarily adapted to perform communication management including access management for a user device and a network device. There are various types of access servers such as a Broadband Access Server (BTAS) which is primarily applied in a broadband communication network. The user device typically refers to a communication device with which an ordinary network user has an access to the communication network, such as a Personal Computer (PC) and a notebook computer. The network device typically refers to a communication device provided by a network operator or a network service provider, located at an access layer of the communication network and adapted to support an access of the user device to the communication network, such as a Digital Subscriber Line Access Multiplexer (DSLAM), a Local Area Network Switch (LAN Switch), an Access Point (AP) and a Cable Modem Terminal System (CMTS).

**[0003]** When the network device and the user device request for accessing a core layer of the communication network, the AS needs to perform access management for the network device and the user device so that the network device and the user device can access the core layer successfully. In a commonly used access management method, the AS regards any communication device issuing a service request as a user equipment and configures the communication device issuing the service request with communication parameters such as an Access Control List (ACL), a Quality of Service (QoS), an authentication policy and a billing policy.

**[0004]** However the network device is intended to support the user device accessing the communication network and is typically not configured with communication parameters such as an authentication policy and a billing policy, and therefore a human operator needs to perform second maintenance or modification of the communication parameters of the network device configured by the AS so as to disable or cancel the communication parameters unnecessary to be configured for the network device. This causes the human operator to perform second maintenance or modification of the communication parameters for numerous network devices and thus reduces greatly the speed of an access of the network device to the communication network. Further excessive second

maintenance or modification operations tend to cause operation errors and hence affect normal communication of the network device and finally affect normal communication of the user device and lower user satisfaction.

**[0005]** A more important problem lies in that the AS needs to allocate a user Connectivity Information Block (CIB) table to each communication device for storing the configured communication parameters after configuring the communication parameters for respective network devices or user devices. Because the CIB table usually stores numerous communication parameters which occupy a large amount of memory space in the AS, the number of CIB tables allocated and stored by the AS is very limited, which may result in that the AS can only support a limited number of communication devices accessing the communication network.

**[0006]** A document "Service Selection in the Access Network" ICC 2001 (2001 IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS. CONFERENCE RECORD. HELSINKY, FINLAND, JUNE 11 - 14, 2001; [IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS], NEW YORK, NY: IEEE, US, vol. 5, 11 June 2001, pages 1622-1626) by MARLY N et al. is directed to provide a local service by making the server selection depending on which NAS the user connects to (see section II.A). A further document US 2003/039268 A1 relates to a system and method for provisioning broadband service in a PPPoE network, in which a modem including a list of multiple domain names is firstly provided, and authentication is performed by software in the modem and is transparent to the user, thus reducing the amount of information that the user has to input manually during authentication.

**[0007]** Further, WO 99/33228 A1 discloses a system and method for provisioning a user terminal for accessing a wideband cable data distribution network, such as an Internet-over-cable system. The system utilizes an auto-provisioning web server to allow provisioning of a user cable modem without need for a field technician to separately input associated modem identification information via a telephone. An LDAP directory is used to store all provisioning information, and is accessible by a DHCP server to selectively allocate network IP addresses to only provisioned terminals. Finally, JP 2003143176 provides a method for dispersedly managing DHCP servers for managing the set information of equipment to be connected to a network in each specific group and managing the set information of equipment to be connected in each specific group.

### Summary of the Invention

**[0008]** In view of this, a main object of the invention is to provide a method, as claimed in claim 1, for implementing communication device access management so as to reduce occupancy of a memory in an access server and increase the number of communication devices for which the access server can perform access manage-

ment

**[0009]** Another object of the invention is to provide a system, as claimed in claim 9, for implementing communication device access management so as to reduce occupancy of a memory in an access server and increase the number of communication devices for which the access server can perform access management.

**[0010]** In order to achieve the above objects, technical solutions of the invention are as follows.

**[0011]** The invention discloses a method, as claimed in claim 1, for implementing communication device access management. Other aspects of the invention are embodiments claimed in the dependent claims.

**[0012]** As compared with the related art, in the method for implementing network device access management according to the invention, all device networks are grouped into at least one device domain and uniform communication attributes are set for the network devices in the same device domain, so that occupancy of a memory in the AS can be reduced significantly and the number of communication devices for which the AS can perform access management is increased. Further, it is not necessary for a human operator to perform second maintenance or parameter modification for the network device due to separate management of a network device and a user device, thereby the number of operations to be performed for management of an access of the network device is reduced and thus both the speed of an access of the network device to the communication network and user satisfaction are improved significantly.

### Brief Description of the Drawings

**[0013]** Figure 1 is a flowchart of network device access management according to a preferred embodiment of the invention;

**[0014]** Figure 2 is a flowchart of network device access management according to another preferred embodiment of the invention; and

**[0015]** Figure 3 is a structural diagram of the system for implementing network device access management according to the invention.

### Detailed Description of the Invention

**[0016]** The invention is described in detail as follows in conjunction with the accompanying drawings and embodiments.

**[0017]** A method for implementing network device access management according to the invention can apply to various access modes, such as a communication device access mode with static address allocation, a communication device access mode with a Dynamic Host Configuration Protocol (DHCP) function and a communication device access mode with a Point to Point Protocol (PPP) function.

**[0018]** The method as claimed in claim 1 for implementing network device access management includes

grouping all network devices into at least one device domain managed by at least one AS and setting a uniform communication attribute for each device domain. The method being object of the invention includes the steps claimed in claim 1.

**[0019]** In practice, no matter whatever access mode is applied to a communication device on which access management is performed, all network devices need to be grouped into at least device domain managed by at least one AS in advance, and each device domain needs to be set with a uniform communication attribute. If there is only one AS in the entire communication network, all the network devices in the communication network are grouped into at least one device domain managed by the AS, and if there is a plurality of ASs in the entire communication network, all the communication devices in the communication network are grouped respectively into at least one device domain managed by the different ASs.

**[0020]** Grouping of device domain can be based upon a specific grouping principle. For instance, geographically adjacent network devices can be grouped into one device domain, and also network devices with the same or similar communication bandwidth level or access privilege can be grouped into one device domain. Any one or more network devices can also be grouped into one device domain.

**[0021]** Generally, a method for setting the communication attribute includes: setting a device domain information table for each device domain, the device domain information table stores contents such as a device domain name, a device domain address pool, a CIB table index and a network device communication attribute that may apply to all the network devices in the device domain. The network device communication attribute typically includes configuration parameters required for configuration of the network devices such as a Committed Access Rate (CAR), an ACL, a transport priority and a Virtual Private Network (VPN).

**[0022]** The AS can perform access management on the communication device after grouping of device domain and setting of the communication attributes for the device domain.

**[0023]** For a communication device with a statically allocated address, the AS is preset with user configuration information of the communication device and a network device identity corresponding to the user configuration information. A specific access management flow is as illustrated in Figure and includes the following.

**[0024]** Block 101: The AS receives in a real time way from a communication device a service request including user configuration information of the communication device. If the communication device is a network device, the user configuration information further includes a network device identity, typically a name of a device domain to which the network device belongs or a data structure consisted of a device domain name and a network device name. The service request is typically an access request in the flow depicted in Figure 1.

**[0025]** Block 102: The AS upon receipt of the service request from the communication device reads the user configuration information included in the service request, determines whether a user configuration information stored in the AS is the same as the user configuration information read in the service request, and if so, determines that the communication device can be managed by the AS, the flow goes to the block 103; otherwise, the flow ends.

**[0026]** Block 103: The AS determines whether it itself stores the network device identity stored in correspondence with the user configuration information, and if so, the flow goes to the block 105; otherwise, the flow goes to the block 104.

**[0027]** Block 104: The AS determines that the communication device is a user device and manages the communication devices with a commonly used method, and the flow ends.

**[0028]** A method through which the AS performs access management on the communication device typically includes that the AS configures the communication device with a communication attribute enabling normal communication of the communication device according to the user configuration information included in the service request, sets a CIB table and stores the configured communication attribute in the CIB table. Thus during subsequent communication of the communication device with the network side, the AS can perform communication management on the communication device with the communication attribute stored in the CIB table.

**[0029]** Block 105: The AS determines that the communication devices is a network device and searches and reads the communication attribute corresponding to the device domain name included in the service request. Specifically, the AS reads the device domain name included in the service request and searches the same device domains as the device domain name read in the respective device domain information tables stored in the AS. When the AS finds the device domain name in one of the device name information tables, the AS determines that the communication attribute included in the found device domain information table is a communication attributes set for the network device and reads the communication attribute included in the device domain information table.

**[0030]** Block 106: A correspondence relationship between the obtained communication attribute and the identifier of the network device is created and stored. A commonly used storage method includes that the communication attribute and the corresponding identifier of the network device are stored together in a CIB table. The CIB table is a unique CIB table set by the AS for the device domain to which the network device belongs. The communication attribute and the corresponding identifier of the network device can also be stored respectively in the CIB table and a routing Forwarding Information Block (FIB) or other data structure.

**[0031]** The identifier of the network device can be an

identifier which can uniquely distinguish different network devices such as a network device name and an Internet Protocol (IP) address allocated for the network device.

**[0032]** The AS accomplishes the access management on the network device after the above operations, and during subsequent communication of the network device with the network side, the AS can perform communication management on the network device with the communication attribute stored in the CIB table corresponding to the identifier of the network device.

**[0033]** It can be seen that in the method for implementing network device access management as illustrated in Figure 1 respective network devices belonging to the same device domain are configured with uniform communication attribute and the configured communication attribute is stored in a CIB table, thereby occupancy of a memory in the AS is reduced significantly and the number of communication devices on which the AS can perform access management is increased. Further in practice, the communication attribute configured uniformly for a device domain can usually be applicable to all network devices in the device domain, and therefore normal communication of the network devices in the device domain will not be affected.

**[0034]** For a communication device, a specific access management flow after grouping of a device domain and setting a communication attribute for the device domain is as illustrated in Figure 2 and includes the following.

**[0035]** Block 201: The AS receives in a real time way from a communication device a service request including user configuration information of the communication device. If the communication device is a network device, the user configuration information further includes a network device identity. The network device identity is typically a name of a device domain to which the network device belongs and can also be a data structure consisting of a device domain name and a network device name. The service request is typically an access request in the flow depicted in Figure 1.

**[0036]** Block 202: The AS upon receipt of the service request from the communication device reads the user configuration information included in the service request, determines whether the read user configuration information includes a network device identity, and if so, the flow goes to the step 204; otherwise, the flow goes to the block 203.

**[0037]** Block 203: The AS determines that the communication device is a user device and performs access management on the communication devices with a commonly used method, and the flow ends. A method in which the AS performs access management on the communication device is the same as the access management method in the block 104.

**[0038]** Block 204: The AS determines that the communication device is a network device and further determines whether the network device belongs to a device domain managed by the AS, and if so, the flow goes to the block 206; otherwise, the flow goes to the block 205.

**[0039]** A specific determination method includes typically that the AS reads the device domain name included in the service request, determines whether there is a device domain information table among respective device domain information tables stored in the AS includes the same device domain name as the device domain name read, and if so, the AS determines that the network device belongs to a device domain managed by itself; otherwise, the AS determines that the network device does not belong to any device domain managed by itself.

**[0040]** Block 205: The AS performs access management on the network device with the same method for the user device and the flow ends. Particularly, a method in which the AS performs access management on the network device is the same as the access management method in the block 203.

**[0041]** Block 206: The AS searches and reads communication attributes corresponding to the device domain name included in the service request. Specifically, the AS reads the device domain name included in the service request and searches the same device domains as the device domain name read in the respective device domain information tables stored in the AS. When the AS finds the device domain name in one of the device name information tables, the AS determines that the found device domain information table is a device domain information table set for the network device and further that communication attribute included in the device domain information table is a communication attribute set for the network device and reads the communication attribute included in the device domain information table.

**[0042]** Further, the AS selects an IP address from an IP address pool included in the device domain information table set for the network device and allocates the network device with the IP address.

**[0043]** Block 207: A correspondence relationship between the obtained communication attribute and the identifier of the network device is created and stored. A commonly used storage method includes that the communication attribute and corresponding identifier of the network device are stored together in a CIB table. The CIB table is a unique CIB table set by the AS for the device domain to which the network device belongs. The communication attribute and the corresponding identifier of the network device can also be stored respectively in the CIB table and a routing Forwarding Information Block (FIB) or another data structure.

**[0044]** It can be seen from Figures 1 and 2 that when none of network devices belonging to a device domain has an access to the AS, no communication attribute of the network device is stored in the CIB table yet. Each time a network device belonging to the device domain accesses the AS, a communication attribute stored each time in the CIB table is the same as communication attribute stored in the previous storage. In this case, the communication attributes in previous storage can be overwritten with the communication attribute currently to be stored. Alternatively, it can also be determined before

storage of the communication attribute whether the CIB table stores any communication attribute, and if so, a correspondence relationship can be created between the identifier of the network device and the communication attribute stored in the CIB table, and the identifier of the network device can be stored in the CIB table; otherwise, a correspondence relationship between the identifier of the network device and the communication attribute read can be created and stored in the CIB table.

**[0045]** The identifier of the network device can be an identifier which can uniquely distinguish different network devices such as a network device name, and an IP address allocated for the network device, a MAC address and other appointed information (e.g. a specific OPTION in the DPCH protocol).

**[0046]** The AS accomplishes access management on the DHCP network device after the above operations, and during subsequent communication of the network device with a network side, the AS can perform communication management on the network device with the communication attribute stored in the CIB table corresponding to the identifier of the network device.

**[0047]** It can be seen that in the method for implementing network device access management as illustrated in Figure 2, respective network devices belonging to the same device domain are configured with a uniform communication attribute and the communication attribute of the respective network devices belonging to the same device domain is stored in a CIB table, thereby occupancy of a memory in the AS is reduced significantly and the number of communication devices on which the AS can perform access management is increased. Further in practice, the communication attribute configured uniformly for a device domain can usually be applicable to all network devices in the device domain, and therefore normal communication of the network devices in the device domain will not be affected.

**[0048]** Further for communication device with a PPP function, a specific access management flow after grouping of a device domain and setting communication attributes for the device domain is the same as the flow illustrated in Figure 2 except that a communication protocol supported by the communication device with the PPP function is different from the communication protocol supported by the communication device with the DHCP function.

**[0049]** It can be seen that in the method for implementing network device access management provided according to the invention, occupancy of a memory in the AS can be reduced significantly and the number of communication devices on which the AS can perform access management is increased. Further, it is not necessary for a human operator to perform second maintenance or parameter modification for the network device due to separate management of the network device and the user device, thereby the number of operations to be performed for management of an access of the network device is reduced and both the speed of an access of the network

device to the communication network and user satisfaction are improved significantly.

**[0050]** Figure 3 is a structural diagram of the system for implementing network device access management according to the invention. Referring to Figure 3, the system includes:

**[0051]** at least one device domain storage module, each device domain storage module stores a uniform communication attribute of a device domain, all network device being grouped into at least one device domain;

**[0052]** at least one AS, including functions of an existing AS and adapted for communication management including management of the device domain. The device domain storage module can be disposed separately from the AS or be disposed in the AS. In the embodiment illustrated in Figure 3, for example, the device domain storage module is disposed separately from the AS. The device domain storage module can be managed by at least one AS.

**[0053]** Unlike the related art, the AS of the invention further includes a determining module and a network device access management unit. The determining module is adapted to determine whether a communication device sending the request is a network device in a device domain managed by the AS according to identifier information carried in a service request by the AS, and if so, the network device access management unit of the AS is triggered to perform processing; otherwise, a user device access management unit of the AS is triggered to perform processing.

**[0054]** The network device access management unit is adapted to obtain from the device domain storage module a communication attribute corresponding to the network device sending the request and to create and store a correspondence relationship between an identifier of the network device and the obtained communication attribute.

**[0055]** The user device access management unit is the same as a user device access management unit of an existing AS, and the communication device sending the service request is performed access management as a user device by the user device access management unit.

**[0056]** In a preferred solution of the system of the invention, each device domain storage module corresponds to a device domain information table, the device domain information table stores at least a device domain name, a device domain address pool, a user CIB table index and a network device communication attribute.

**[0057]** Further, the network device can be a DSLAM, a LAN Switch, an AP or a CMTS. The identifier of the network device can be a network device name, an IP address allocated for the network device, an MAC address or other appointed information (e.g. a specific OPTION in the DPCH protocol). The access server can be a broadband access server.

**[0058]** The above description is merely illustration of the preferred embodiments of the invention, but the scope of the invention, is defined by the appended claims.

## Claims

1. A method for implementing communication device access management, a communication device being a network device or a user device, whereby a user device is a communication device with which an ordinary network user has an access to a communication network and a network device is a communication device adapted to support an access of the user device to the communication network, whereby all network devices are grouped into at least one device domain managed by at least one Access Server, AS, and a uniform communication attribute is set for all the network devices in each device domain, the method comprising:

receiving (101), by the AS, a service request from a communication device;  
determining (103) whether the communication device is a network device in the device domain managed by the AS according to user configuration information included in the received service request; and  
if the communication device is a network device in the device domain managed by the AS, obtaining (105) the uniform communication attribute set for all the network devices in said device domain, and creating and storing (106) a correspondence relationship between an identifier of the network device and the obtained uniform communication attribute;  
otherwise, determining that the communication device is a user device and managing the communication device as a user device.

2. The method according to claim 1, wherein determining (103) whether the communication device is a network device in the device domain managed by the AS comprises:

reading, by the AS, user configuration information comprised in the received service request;  
determining that a user configuration information stored in the AS is the same as the user configuration information read in the service request;  
determining, by the AS, whether a network device identity is stored in the AS in correspondence with the user configuration information; and  
determining that the communication device is one of the network devices in the device domain managed by the AS if a network device identity is stored in the AS in correspondence with the user configuration information.

3. The method according to claim 1, wherein determining (103) whether the communication device send-

ing the request is a network device in the device domain managed by the AS comprises:

reading, by the AS, user configuration information comprised in the received service request; 5  
determining that the user configuration information comprises a network device identity;  
reading a device domain name comprised in the service request and determining whether the AS manages a device domain corresponding to the domain name; and 10  
determining that the communication device is a network device in the device domain managed by the AS if the AS manages the device domain corresponding to the domain name. 15

4. The method according to claim 1, wherein obtaining (105) the uniform communication attribute comprises: 20

reading, by the AS, a device domain name comprised in the service request, and searching and reading a communication attribute corresponding to the device domain name in the AS. 25

5. The method according to claim 1, wherein the network device is a Digital Subscriber Line Access Multiplexer, a Local Area Network Switch, an Access Point or a Cable Modem Terminal System. 30

6. The method according to claim 1, wherein, the service request is an access request. 35

7. The method according to claim 1, wherein, the identifier of the network device is a network device name, an Internet Protocol address allocated for the network device, a MAC address or an OPTION in DHCP protocol. 40

8. The method according to claim 1, wherein the access server is a broadband access server. 45

9. A system for implementing communication device access management, a communication device being a network device or a user device, whereby a user device is a communication device with which an ordinary network user has an access to a communication network and a network device is a communication device adapted to support an access of the user device to the communication network, whereby all network devices are grouped into at least one device domain managed by at least one Access Server, AS; said system comprising: 50

at least one device domain storage module being adapted to store a uniform communication attribute which is set for all the network devices in each device domain; and 55

at least one AS, adapted for communication management comprising management of the device domain;

wherein the AS further comprises a determining module adapted to

determine whether a communication device sending a service request is a network device in a device domain managed by the AS according to user configuration information included in the service request; wherein,

if the communication device sending the service request is a network

device in the device domain managed by the AS, a network device access management unit of the AS is adapted to be triggered to perform processing; and wherein,

if the communication device sending the service request is not a network device in the device domain managed by the AS, a user device access management unit of the AS is adapted to be triggered to perform processing;

wherein the network device access management unit is adapted to obtain from the device domain storage module the uniform communication attribute set for all the network devices in said device domain, and create and store a correspondence relationship between an identifier of the network device and the obtained uniform communication attribute; and

wherein the user device access management unit is adapted to manage the communication device as a user device.

10. The system according to claim 9, wherein each device domain storage module corresponds to a device domain information table, the device domain information table being adapted to store at least a device domain name, a device domain address pool, the uniform communication attribute set in the device domain and an index to a user Connectivity Information Block table, said user Connectivity Information Block table being adapted to store the obtained uniform communication attribute and the corresponding identifier of the network device. 55

11. The system according to claim 9, wherein the network device is a Digital Subscriber Line Access Multiplexer, a Local Area Network Switch, an Access Point or a Cable Modem Terminal System. 60

12. The system according to claim 9, wherein the identifier of the network device is a network device name, an IP address allocated for the network device, a MAC address or an OPTION in DHCP protocol. 65

13. The system according to claim 9, wherein the access server is a broadband access server. 70

## Patentansprüche

1. Verfahren zum Implementieren einer Kommunikationseinrichtungszugangsverwaltung, wobei eine Kommunikationseinrichtung eine Netzeinrichtung oder eine Benutzereinrichtung ist, wodurch eine Benutzereinrichtung eine Kommunikationseinrichtung ist, mit der ein gewöhnlicher Netzbenutzer einen Zugang zu einem Kommunikationsnetz hat, und eine Netzeinrichtung eine Kommunikationseinrichtung ist, die dafür ausgelegt ist, einen Zugang der Benutzereinrichtung zu dem Kommunikationsnetz zu unterstützen, wodurch alle Netzeinrichtungen in mindestens eine Einrichtungsdomäne gruppiert werden, die von mindestens einem Access Server AS verwaltet wird, und ein gleichförmiges Kommunikationsattribut für alle Netzeinrichtungen in jeder Einrichtungsdomäne gesetzt wird, wobei das Verfahren Folgendes umfasst:

Empfangen (101) einer Dienstanfrage durch den AS von einer Kommunikationseinrichtung; Bestimmen (103), ob die Kommunikationseinrichtung eine Netzeinrichtung in der Einrichtungsdomäne ist, die von dem AS gemäß in der empfangenen Dienstanforderung enthaltenen Benutzerkonfigurationsinformationen verwaltet wird; und falls die Kommunikationseinrichtung eine Netzeinrichtung in der von dem AS verwalteten Einrichtungsdomäne ist, Erhalten (105) des für alle Netzeinrichtungen in der Einrichtungsdomäne gesetzten gleichförmigen Kommunikationsattributs und Anlegen und Speichern (106) einer Korrespondenzbeziehung zwischen einer Kennung der Netzeinrichtung und dem erhaltenen gleichförmigen Kommunikationsattribut; ansonsten Bestimmen, dass die Kommunikationseinrichtung eine Benutzereinrichtung ist und Verwalten der Kommunikationseinrichtung als Benutzereinrichtung.

2. Verfahren nach Anspruch 1, wobei das Bestimmen (103), ob die Kommunikationseinrichtung eine Netzeinrichtung in der von dem AS verwalteten Einrichtungsdomäne ist, Folgendes umfasst:

Lesen von in der empfangenen Dienstanforderung umfassten Benutzerkonfigurationsinformationen durch den AS; Bestimmen, dass eine in dem AS gespeicherte Benutzerkonfigurationsinformation die gleiche ist wie die in der Dienstanforderung gelesene Benutzerkonfigurationsinformation; Bestimmen durch den AS, ob eine Netzeinrichtungsidentität in dem AS in Korrespondenz mit der Benutzerkonfigurationsinformation gespeichert ist; und

Bestimmen, dass die Kommunikationseinrichtung eine der Netzeinrichtungen in der von dem AS verwalteten Einrichtungsdomäne ist, falls eine Netzeinrichtungsidentität in dem AS in Korrespondenz mit der Benutzerkonfigurationsinformation gespeichert ist.

3. Verfahren nach Anspruch 1, wobei das Bestimmen (103), ob die die Anforderung sendende Kommunikationseinrichtung eine Netzeinrichtung in der von dem AS verwalteten Einrichtungsdomäne ist, Folgendes umfasst:

Lesen von in der empfangenen Dienstanforderung umfassten Benutzerkonfigurationsinformationen durch den AS;

Bestimmen, dass die Benutzerkonfigurationsinformationen eine Netzeinrichtungsidentität umfassen;

Lesen eines in der Dienstanforderung umfassten Einrichtungsdomänennamens und Bestimmen, ob der AS eine dem Domänennamen entsprechende Einrichtungsdomäne verwaltet; und

Bestimmen, dass die Kommunikationseinrichtung eine Netzeinrichtung in der von dem AS verwalteten Einrichtungsdomäne ist, falls der AS die dem Domänennamen entsprechende Einrichtungsdomäne verwaltet.

4. Verfahren nach Anspruch 1, wobei das Erhalten (105) des gleichförmigen Kommunikationsattributs Folgendes umfasst:

Lesen eines in der Dienstanforderung umfassten Einrichtungsdomänennamens durch den AS und Suchen und Lesen eines dem Einrichtungsdomänennamen in dem AS entsprechenden Kommunikationsattributs.

5. Verfahren nach Anspruch 1, wobei die Netzeinrichtung ein DSL-Zugangskonzentrator (Digital Subscriber Line Access Multiplexer), ein LAN-Switch, ein Access-Point- oder ein Kabelmodemterminalsyste ist.

6. Verfahren nach Anspruch 1, wobei die Dienstanforderung eine Zugangsanforderung ist.

7. Verfahren nach Anspruch 1, wobei die Kennung der Netzeinrichtung ein Netzeinrichtungsname, eine für die Netzeinrichtung zugeordnete Internetprotokolladresse, eine MAC-Adresse oder eine OPTION im DHCP-Protokoll ist.

8. Verfahren nach Anspruch 1, wobei der Zugangsserver ein Breitbandzugangsserver ist.

9. System zum Implementieren einer Kommunikationseinrichtungszugangsverwaltung, wobei eine Kommunikationseinrichtung eine Netzeinrichtung oder eine Benutzereinrichtung ist, wodurch eine Benutzereinrichtung eine Kommunikationseinrichtung ist, mit der ein gewöhnlicher Netzbenutzer einen Zugang zu einem Kommunikationsnetz hat, und eine Netzeinrichtung eine Kommunikationseinrichtung ist, die dafür ausgelegt ist, einen Zugang der Benutzereinrichtung zu dem Kommunikationsnetz zu unterstützen, wodurch alle Netzeinrichtungen in mindestens eine Einrichtungsdomäne gruppiert werden, die von mindestens einem Access Server AS verwaltet wird;

wobei das System Folgendes umfasst:

mindestens ein Einrichtungsdomänenspeichermodul, das ausgelegt ist zum Speichern eines gleichförmigen Kommunikationsattributs, das für alle Netzeinrichtungen in jeder Einrichtungsdomäne gesetzt ist; und  
mindestens einen AS, ausgelegt zur Kommunikationsverwaltung umfassend die Verwaltung der Einrichtungsdomäne;

wobei der AS weiterhin ein Bestimmungsmodul umfasst, ausgelegt zum:

Bestimmen, ob eine eine Dienstanforderung sendende Kommunikationseinrichtung eine Netzeinrichtung in einer von dem AS gemäß in der Dienstanforderung enthaltenen Benutzerkonfigurationsinformationen verwalteten Einrichtungsdomäne ist, wobei, falls die die Dienstanforderung sendende Kommunikationseinrichtung eine Netzeinrichtung in der von dem AS verwalteten Einrichtungsdomäne ist, eine Netzeinrichtungszugangsverwaltungseinheit des AS ausgelegt ist, um ausgelöst zu werden, um eine Verarbeitung durchzuführen; und wobei,

falls die die Dienstanforderung sendende Kommunikationseinrichtung keine Netzeinrichtung in der von dem AS verwalteten Einrichtungsdomäne ist, eine Benutzereinrichtungszugangsverwaltungseinheit des AS ausgelegt ist, um ausgelöst zu werden, um eine Verarbeitung auszuführen;

wobei die Netzeinrichtungszugangsverwaltungseinheit ausgelegt ist, um von dem Einrichtungsdomänenspeichermodul das für alle Netzeinrichtungen in der Einrichtungsdomäne gesetzte gleichförmige Kommunikationsattribut zu erhalten und eine Korrespondenzbeziehung zwischen einer Kennung der Netzeinrichtung und dem erhaltenen gleichförmigen Kommunikationsattribut anzulegen und zu speichern; und wobei die Benutzereinrichtungszugangsverwaltungseinheit ausgelegt ist zum Verwalten der Kommunikationseinrichtung als Benutzerein-

richtung.

10. System nach Anspruch 9, wobei jedes Einrichtungsdomänenspeichermodul einer Einrichtungsdomäneninformationstabelle entspricht, wobei die Einrichtungsdomäneninformationstabelle ausgelegt ist zum Speichern mindestens eines Einrichtungsdomänennamens, eines Einrichtungsdomänenadresspools, des in der Einrichtungsdomäne gesetzten gleichförmigen Kommunikationsattributs und eines Indexes zu einer Benutzerkonnektivitätsinformationsblocktabelle, wobei die Benutzerkonnektivitätsinformationsblocktabelle ausgelegt ist zum Speichern des erhaltenen gleichförmigen Kommunikationsattributs und der entsprechenden Kennung der Netzeinrichtung.

11. System nach Anspruch 9, wobei die Netzeinrichtung ein DSL-Zugangskonzentrator (Digital Subscriber Line Access Multiplexer), ein LAN-Switch, ein Access-Point- oder ein Kabelmodemterminalsyste ist.

12. System nach Anspruch 9, wobei die Kennung der Netzeinrichtung ein Netzeinrichtungsname, eine für die Netzeinrichtung zugeordnete IP-Adresse, eine MAC-Adresse oder eine OPTION im DHCP-Protokoll ist.

13. System nach Anspruch 9, wobei der Zugangsserver ein Breitbandzugangsserver ist.

## Revendications

1. Procédé permettant de mettre en oeuvre une gestion d'accès à des dispositifs de communication, un dispositif de communication étant un dispositif réseau ou un dispositif utilisateur, grâce à quoi un dispositif utilisateur est un dispositif de communication avec lequel un utilisateur ordinaire de réseau obtient un accès à un réseau de communication, et un dispositif réseau est un dispositif de communication conçu pour prendre en charge un accès du dispositif utilisateur au réseau de communication, grâce à quoi tous les dispositifs réseau sont groupés en au moins un domaine de dispositifs géré par au moins un serveur d'accès, AS, et un attribut uniforme de communication est établi pour la totalité des dispositifs réseau dans chaque domaine de dispositifs, le procédé comprenant :

la réception (101), par le serveur d'accès AS, d'une demande de service provenant d'un dispositif de communication, le fait de déterminer (103) si le dispositif de communication est ou non un dispositif réseau dans le domaine de dispositifs géré par le serveur

d'accès AS en fonction d'informations de configuration utilisateur incluses dans la demande de service reçue, et

si le dispositif de communication est un dispositif réseau dans le domaine de dispositifs géré par le serveur d'accès AS, la récupération (105) de l'attribut uniforme de communication établi pour la totalité des dispositifs réseau dans ledit domaine de dispositifs, ainsi que la création et la mémorisation (106) d'une relation de correspondance entre un identificateur du dispositif réseau et l'attribut uniforme de communication obtenu, sinon, le fait de déterminer de ce que le dispositif de communication est un dispositif utilisateur et de gérer le dispositif de communication comme un dispositif utilisateur.

2. Procédé selon la revendication 1, dans lequel le fait de déterminer (103) si le dispositif de communication est ou non un dispositif réseau dans le domaine de dispositifs géré par le serveur d'accès AS comprend :

la lecture, par le serveur d'accès AS, des informations de configuration utilisateur comprises dans la demande de service reçue, le fait de déterminer de ce que les informations de configuration d'un utilisateur mémorisées dans le serveur d'accès AS sont les mêmes que les informations de configuration utilisateur lues dans la demande de service, le fait de déterminer, par le serveur d'accès AS, si l'identité d'un dispositif réseau est mémorisée ou non dans le serveur d'accès AS en correspondance avec les informations de configuration utilisateur, et le fait de déterminer que le dispositif de communication est l'un des dispositifs réseau dans le domaine de dispositifs géré par le serveur d'accès AS si une identité de dispositif réseau est mémorisée dans le serveur d'accès AS en correspondance avec les informations de configuration utilisateur.

3. Procédé selon la revendication 1, dans lequel le fait de déterminer (103) si le dispositif de communication envoyant la demande est ou non un dispositif réseau dans le domaine de dispositifs géré par le serveur d'accès AS comprend :

la lecture, par le serveur d'accès AS, d'informations de configuration utilisateur comprises dans la demande de service reçue, le fait de déterminer que les informations de configuration utilisateur comprennent une identité de dispositif réseau, la lecture d'un nom de domaine de dispositifs

compris dans la demande de service et le fait de déterminer si le serveur d'accès AS gère ou non un domaine de dispositifs correspondant au nom de domaine, et

le fait de déterminer que le dispositif de communication est un dispositif réseau dans le domaine de dispositifs géré par le serveur d'accès AS si le serveur d'accès AS gère le domaine de dispositifs correspondant au nom de domaine.

4. Procédé selon la revendication 1, dans lequel la récupération (105) de l'attribut uniforme de communication comprend :

la lecture, par le serveur d'accès AS, d'un nom de domaine de dispositifs compris dans la demande de service, ainsi que la recherche et la lecture d'un attribut de communication correspondant au nom de domaine de dispositifs dans le serveur d'accès AS.

5. Procédé selon la revendication 1, dans lequel le dispositif réseau est un multiplexeur d'accès aux lignes d'abonnés numériques, un commutateur de réseau local, un point d'accès ou un système terminal de modem par câble.

6. Procédé selon la revendication 1, dans lequel la demande de service est une demande d'accès.

7. Procédé selon la revendication 1, dans lequel l'identificateur du dispositif réseau est un nom de dispositif réseau, une adresse au protocole Internet allouée au dispositif réseau, une adresse de couche MAC ou une OPTION dans le protocole DHCP.

8. Procédé selon la revendication 1, dans lequel le serveur d'accès est un serveur d'accès à large bande.

9. Système permettant de mettre en oeuvre une gestion d'accès à des dispositifs de communication, un dispositif de communication étant un dispositif réseau ou un dispositif utilisateur, grâce à quoi un dispositif utilisateur est un dispositif de communication avec lequel un utilisateur ordinaire de réseau obtient un accès à un réseau de communication, et un dispositif réseau est un dispositif de communication conçu pour prendre en charge un accès du dispositif utilisateur au réseau de communication, grâce à quoi tous les dispositifs réseau sont groupés en au moins un domaine de dispositifs géré par au moins un serveur d'accès, AS, ledit système comprenant :

au moins un module de mémorisation de domaine de dispositifs conçu pour mémoriser un attribut uniforme de communication qui est établi pour tous les dispositifs réseau dans chaque do-

maine de dispositifs, et  
 au moins un serveur d'accès AS, conçu pour la  
 gestion de communication, ce qui comprend la  
 gestion du domaine de dispositifs,  
 dans lequel le serveur d'accès AS comprend en  
 outre un module de détermination conçu pour  
 déterminer si un dispositif de communication en-  
 voyant une demande de service est un dispositif  
 réseau dans un domaine de dispositifs géré par  
 le serveur d'accès AS en fonction des informa-  
 tions de configuration utilisateur comprises dans  
 la demande de service, dans lequel,  
 si le dispositif de communication envoyant la de-  
 mande de service est un dispositif réseau dans  
 le domaine de dispositifs géré par le serveur  
 d'accès AS, une unité de gestion d'accès aux  
 dispositifs réseau du serveur d'accès AS est  
 conçue pour être déclenchée afin d'effectuer un  
 traitement, et dans lequel,  
 si le dispositif de communication envoyant la de-  
 mande de service n'est pas un dispositif réseau  
 dans le domaine de dispositifs géré par le ser-  
 veur d'accès AS, une unité de gestion d'accès  
 aux dispositifs réseaux du serveur d'accès AS  
 est conçue pour être déclenchée pour effectuer  
 un traitement,  
 dans lequel l'unité de gestion d'accès aux dis-  
 positifs réseau est conçue pour récupérer du  
 module de mémorisation du domaine de dispo-  
 sitifs l'attribut uniforme de communication établi  
 pour tous les dispositifs réseau dans ledit do-  
 maine de dispositifs, et pour créer et mémoriser  
 une relation de correspondance entre un iden-  
 tificateur du dispositif réseau et l'attribut unifor-  
 me de communication obtenu, et  
 dans lequel l'unité de gestion d'accès aux dis-  
 positifs utilisateur est conçue pour gérer le dis-  
 positif de communication comme un dispositif  
 utilisateur.

10. Système selon la revendication 9, dans lequel cha-  
 que module de mémorisation de domaine de dispo-  
 sitifs correspond à une table d'informations de do-  
 maine de dispositifs, la table d'informations de do-  
 maine de dispositifs étant conçue pour mémoriser  
 au moins un nom de domaine de dispositifs, un re-  
 groupement d'adresses de domaine de dispositifs,  
 l'attribut uniforme de communication établi dans le  
 domaine de dispositifs et un index vers une table de  
 blocs d'informations de connectivités utilisateurs, la-  
 dite table de blocs d'informations de connectivités  
 utilisateurs étant conçue pour mémoriser l'attribut  
 uniforme de communication obtenu et l'identificateur  
 correspondant du dispositif réseau.

11. Système selon la revendication 9, dans lequel le dis-  
 positif réseau est un multiplexeur d'accès aux lignes  
 d'abonnés numériques, un commutateur de réseau

local, un point d'accès ou un système terminal de  
 modem par câble.

12. Système selon la revendication 9, dans lequel l'iden-  
 tificateur du dispositif réseau est un nom de dispositif  
 réseau, une adresse au protocole IP allouée au dis-  
 positif réseau, une adresse de couche MAC ou une  
 OPTION dans le protocole DHCP.
13. Système selon la revendication 9, dans lequel le ser-  
 veur d'accès est un serveur d'accès à large bande.

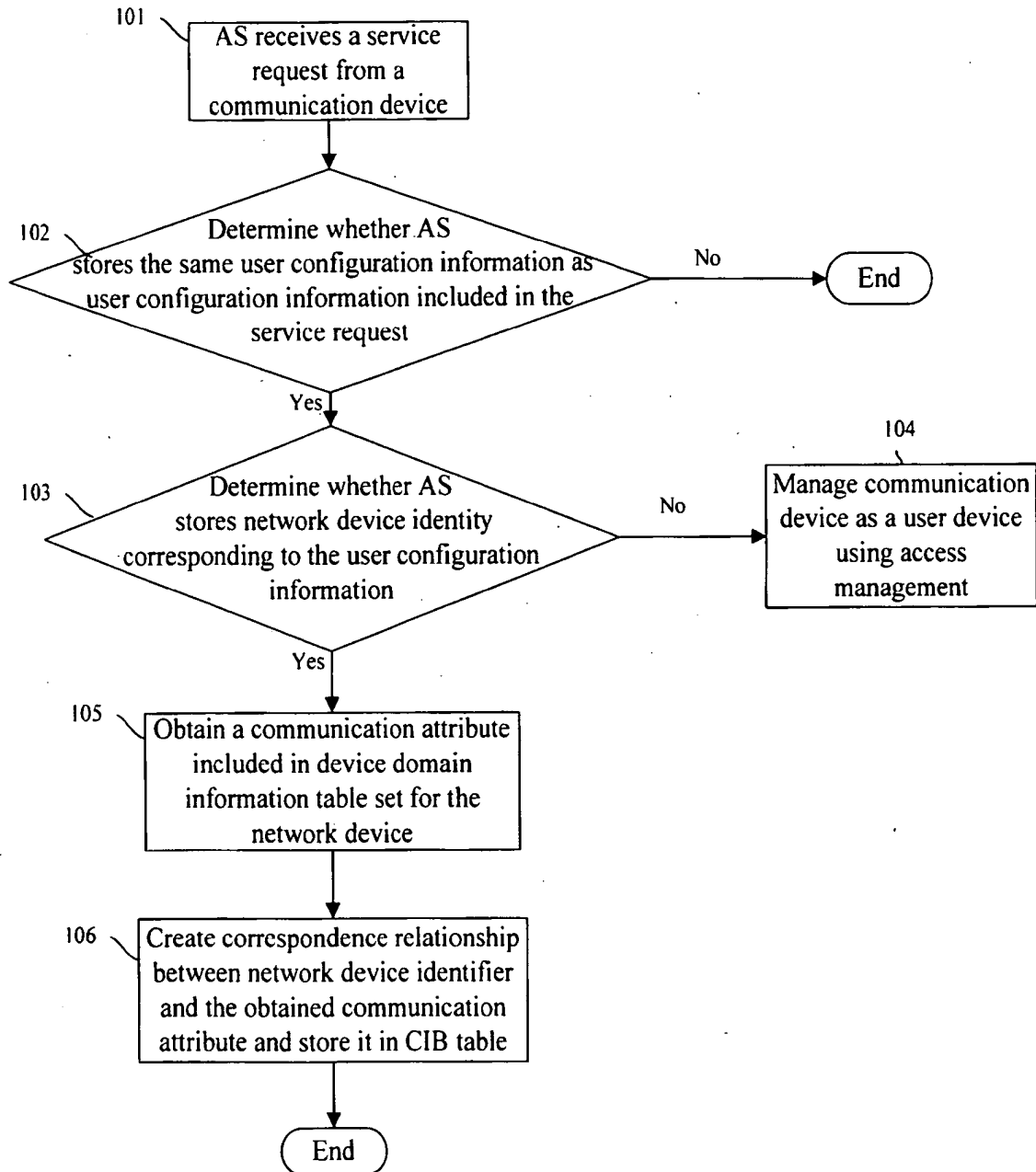


Fig.1

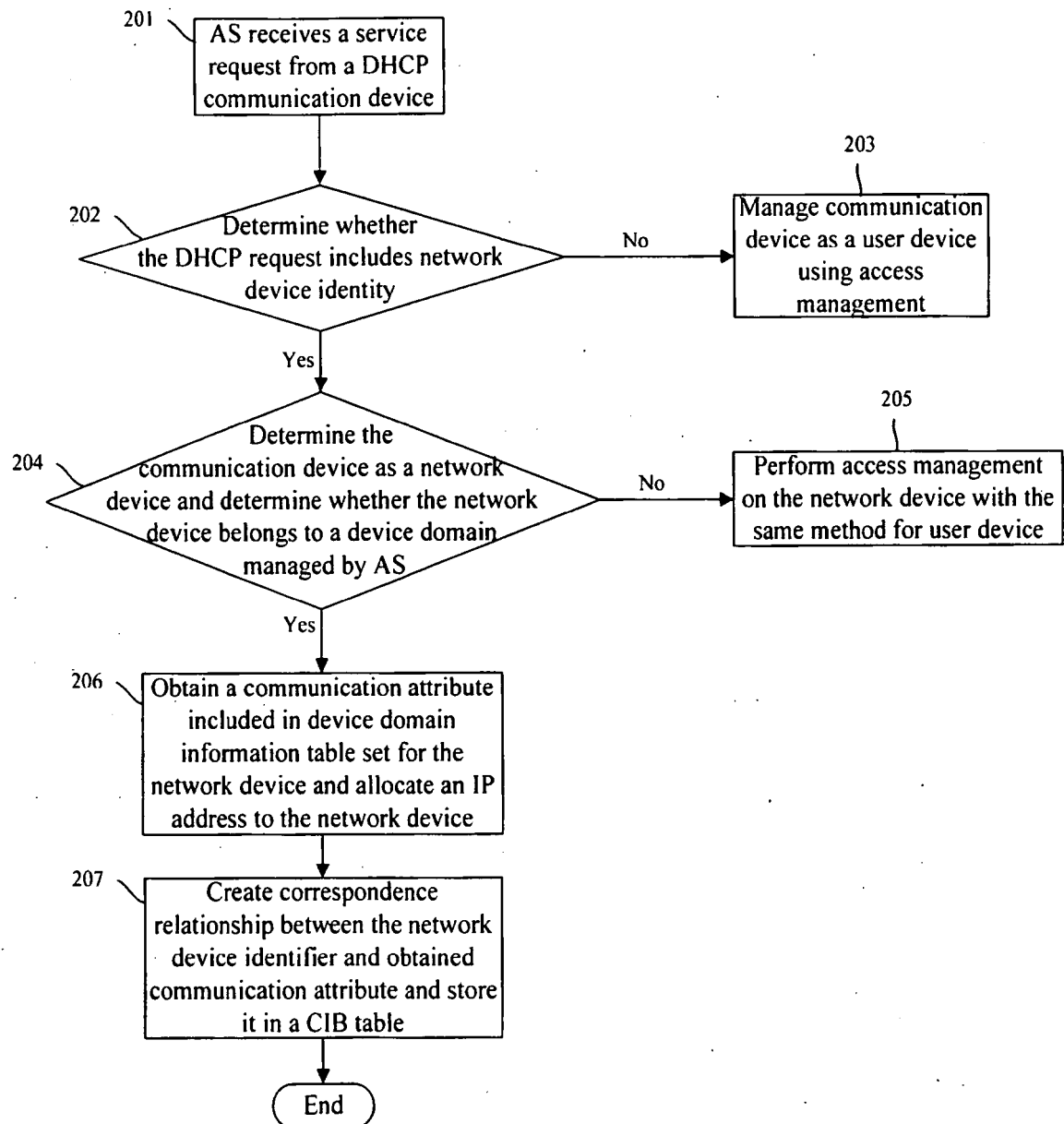


Fig.2

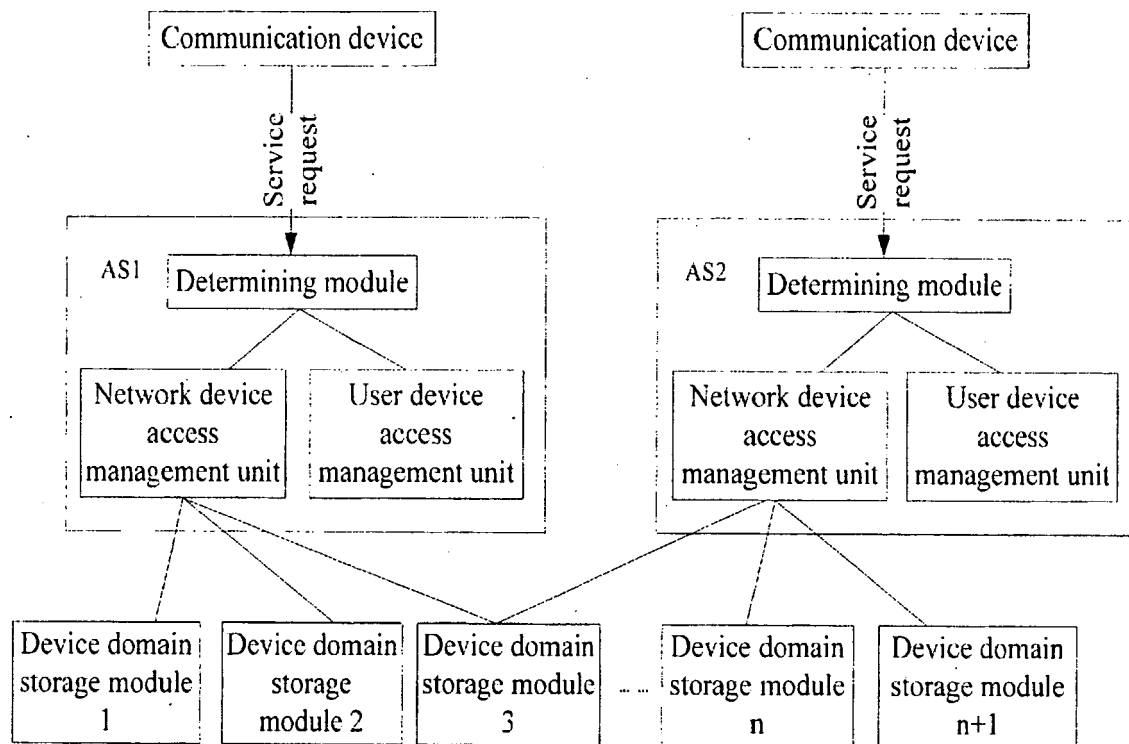


Fig.3

**REFERENCES CITED IN THE DESCRIPTION**

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